Logic and Logical Philosophy
Volume 27 (2018), 151–160
DOI: 10.12775/LLP.2017.018

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PLANTINGA'S HAECCEITISM AND SIMPLEST QUANTIFIED MODAL LOGIC

Abstract. In a series of papers Alvin Plantinga argued for a serious actualist modal semantics based on the notions of a possible world, understood as a maximal possible state of affairs, and of individual essence (haecceity). Plantinga's actualism is known as haecceitism. In spite of the fact that haecceitism has been thought by Plantinga to require a Kripke-style semantics, the aim of this paper is to show that it is compatible with constant domains semantics and the simplest quantified modal logic. I will argue that not only does this approach have all the advantages of a greater simplicity in combining quantification and modalities, but also it better conforms to the actualist program.

Keywords: haecceitism; Kripke models; simplest quantified modal logic

1. Introduction

A topic in philosophy of logic and metaphysics concerns the possibility of combining first-order modal logic with actualism, where by actualism it is generally meant the claim that there are no things that do not exist, such as merely possible objects. According to Plantinga, actualism is to be endorsed as the necessitation of that claim, that is the view that *necessarily* there are no nonexistent objects: "there neither are nor could have been things that do not exist" [8, p. 143]. Plantinga also argued for the thesis that actualism entails serious actualism, i.e., the view that «necessarily, no object could have had a property or stood in a relation without existing» [9, p. 4]; in terms of possible worlds: "necessarily, no object has a property in a world in which it does not exist" [9, p. 11].

Received June 27, 2016. *Revised* May 30, 2017. *Published online* June 19, 2017

The actualist theory advocated by Plantinga is known as haecceitism, and it aims to be actualist and serious actualist. It is based on the notions of possible world, understood as a maximal possible state of affairs, and of individual essence (haecceity). Haecceities are to be taken as a special kind of purely qualitative property: following Adams [1], a purely qualitative property can be considered as such if it can expressed without the use of referential expressions, such as indexicals or proper names (cf. [1, p. 7]). Both maximal possible states of affairs and haecceities are thought of as abstract objects that necessarily exist.

In spite of the fact that haecceitism has been thought by Plantinga to require a Kripke-style semantics, the aim of this paper is to show that it is consistent with constant domains semantics and the simplest quantified modal logic. As we will see Section 3, this approach has important advantages with respect to the actualist program.

2. Haecceitistic Kripke-style semantics

Let $\mathcal{L}_1$ a first-order modal language. $\mathcal{L}_1$ is the same of that of standard first-order logic but augmented with the customary modal operator, "$\Box$", expressing the notion of necessity, together with the corresponding formation rule: if φ is a formula, so is $\ulcorner\Box\varphi\urcorner$. The modal operator "$\Diamond$" for the notion of possibility can be added by the definition: $\ulcorner\Diamond\varphi\urcorner$ means $\ulcorner\neg\Box\neg\varphi\urcorner$. $\mathcal{L}_1$ does not contain individual constants, in accordance with Kripke [5].

A Kripke model is a five-tuple $\mathcal{M} = \langle W, @, D, V, Q\rangle$, where W is a non-empty set of worlds, @ is a member of W representing the actual one, D is a non-empty domain of discourse containing all possible objects, V is a function such that for any n-place predicate ψ, and for any world $w \in W$, $V(\psi, w) \subseteq D^n$, and Q is a function such that for any possible $w \in W$, $Q(w) \subseteq D$. $Q(w)$ is the inner domain of w representing the objects that exist in that world. For our purposes the accessibility relation among worlds can be skipped.

Let υ be a function from variables into D; if φ is an atomic formula of the form $\ulcorner\psi^n(\mathbf{x}_1 ... \mathbf{x}_n)\urcorner$, then υ satisfies$_\mathcal{M}$ (i.e., satisfies in a model $\mathcal{M}$) φ with respect to a world w if, and only if, $\langle\upsilon(\mathbf{x}_1), \ldots, \upsilon(\mathbf{x}_n)\rangle \in V(\psi^n, w)$. If φ has the form $\ulcorner\neg\psi\urcorner$, υ satisfies$_\mathcal{M}$ φ with respect to a world w if, and only if, υ does not satisfy$_\mathcal{M}$ ψ with respect to w. If φ has the form $\ulcorner\psi \vee \gamma\urcorner$, υ satisfies$_\mathcal{M}$ φ with respect to a world w if, and only if,

υ satisfies$_{\mathcal{M}}$ ψ or υ satisfies$_{\mathcal{M}}$ γ with respect to w. If φ has the form $\ulcorner\forall\mathbf{x}\psi\urcorner$, υ satisfies$_{\mathcal{M}}$ φ with respect to a world w if, and only if, for any υ' different from υ at most for $\mathbf{x}$ such that $\upsilon'(\mathbf{x}) \in Q(w)$, υ' satisfies$_{\mathcal{M}}$ ψ with respect to w. If φ has the form $\ulcorner\Box\psi\urcorner$, υ satisfies$_{\mathcal{M}}$ φ with respect to a world w if, and only if, for any world w', υ satisfies$_{\mathcal{M}}$ ψ with respect to w'.

A formula φ is said to be true$_{\mathcal{M}}$ (i.e., truth in a model $\mathcal{M}$) in a world w if, and only if, for any υ, υ satisfies$_{\mathcal{M}}$ φ with respect to w. φ is said to be true$_{\mathcal{M}}$ if, and only if, it is true$_{\mathcal{M}}$ with respect to @. φ is said to be valid if, and only if, it is true$_{\mathcal{M}}$ for any model $\mathcal{M}$.

The Barcan logical scheme, $\ulcorner\Diamond\exists\mathbf{x}\varphi \rightarrow \exists\mathbf{x}\Diamond\varphi\urcorner$ (**BS**), and its converse, $\ulcorner\exists\mathbf{x}\Diamond\varphi \rightarrow \Diamond\exists\mathbf{x}\varphi\urcorner$ (**CBS**) – the endorsement of which is commonly thought to imply commitments to possibilia – are not valid in Kripke semantics. To avoid deriving the Barcan formulas, Kripke's quantified modal logic banishes individual constants and allows only closed formulas to be theorems, so that e.g. $\ulcorner\forall\mathbf{x}\varphi(\mathbf{x}) \rightarrow \varphi(\mathbf{y})\urcorner$ is not a theorem, whilst $\ulcorner\forall\mathbf{y}(\forall\mathbf{x}\varphi(\mathbf{x}) \rightarrow \varphi(\mathbf{y}))\urcorner$ is (cf. [5]). It is to be noted that the prohibition of using individual constants has important limitations in formalizing ordinary language, for sentences containing names cannot be adequately treated.

In Kripke models, in virtue of function Q, each possible world w has its own domain of objects; intuitively, the objects that exist in w. Because quantifiers are restricted to inner domains, it is never the case that they range over nonexistent objects. Nevertheless, as Plantinga pointed out, actualism fails in the metalanguage of the models. In fact, consider the intuitive true sentence (1) "there could have been things that do not actually exist", or more clearly "possibly, there exists an object distinct from each object that exists in @". To give an account of (1), D is to be assumed to contain objects that do not exist in @, i.e., nonexistent objects which quantifiers of the metalanguage range over. Even if Kripke models are required to have decreasing inner domains, so as to make false all sentences of the same logical form as (1), that some actual objects exist contingently implies a possible world w whose inner domain does not contain those objects. Thus if w had been actual, there would have been in D nonexistent objects, in violation of the tenets of actualism (cf. [8, p. 142]).

Serious actualism fails in Kripke models, for objects are explicitly allowed to have properties in worlds in which they do not exist. In fact, as we have seen, V assigns each predicate an extension with respect to a world w regardless of the existence in w of the components of that extension.

In order to solve these problems, in order to find a correct and serious actualist semantics, Plantinga proposed to replace standard objects by individual essences in the framework of Kripke semantics, where an individual essence of an object x is an essential property unique to x. Using Plantinga's words, "G is an essence if, and only if, it is possible that G is exemplified by an object x that (a) has G necessarily and (b) is such that it is not possible that something distinct from x have G" [10, p. 140]. Note that Plantinga's definition of essence allows objects to have more than one essence. Replacing standard objects by essences, commitments to possibilia in the metalanguage of the models would be avoided by regarding any statement concerning merely possible objects as a statement concerning unexemplified actual essences. Thus (1) becomes (2) "possibly, there is an exemplified essence distinct from each essence exemplified in @". To interpret (2) we have only to assume the domain D to contain unexemplified essences, instead of nonexistent objects.

Another feature of haecceitism consists of interpreting predication in terms of co-exemplification of properties. Co-exemplification can be defined as follows: for any possible world w, the properties P and Q are co-exemplified in w if, and only if, if w had been actual, there would have been some object exemplifying both P and Q; more generally, for any possible world w, R^n is co-exemplified in w with the n-tuple of properties $\langle P_1, \ldots, P_n \rangle$ if, and only if, if w had been actual, there would have been objects $a_1, \ldots, a_n$ such that a_1 has the property of being P_1, …, a_n has the property of being P_n, and R^n applies to $\langle a_1, \ldots, a_n \rangle$.

As Jager [4] and Menzel [6] put things, an haecceitistic Kripke model can be presented as a five-tuple $\mathcal{M} = \langle W, @, D, V, Q \rangle$, where W, @, Q are defined as above, D is a set of haecceities, and V is such that for any predicate ψ^n, for any $w \in W$, $V(\psi^n, w) \subseteq Q(w)^n$. Serious actualism is guaranteed by this last constraint.

If υ is an assignment from variables into individual essences, then υ satisfies$_{\mathcal{M}}$ the atomic formula $\ulcorner \psi^n \mathbf{x}_1 \ldots \mathbf{x}_n \urcorner$ with respect to a world $w \in W$ if, and only if, $\langle \upsilon(\mathbf{x}_1) \ldots \upsilon(\mathbf{x}_n) \rangle \in V(\psi^n, w)$, i.e., V specifies that the relation expressed by ψ is co-exemplified in w with the n-tuple of essences $\langle \upsilon(\mathbf{x}_1) \ldots \upsilon(\mathbf{x}_n) \rangle$. Satisfaction conditions for disjunction and quantified formulas are defined as in the standard Kripke models. Just as in standard Kripke models quantifiers are restricted to the existent objects of each world, so in the haecceitistic Kripke models they are restricted to the essences that are exemplified in each world.

In the axiomatized semantics proposed by Jager [4], negation and modality are taken to be *de re*. Thus the sentence (3) "Socrates is not wise" is interpreted as meaning: Socrates has the property of being nonwise (i.e., the complement of the property of being wise). And the sentence (4) "necessarily, Socrates is a male" is interpreted as meaning: Socrates is *essentially* a male, i.e., Socrates is such that in every possible world in which he exists, he is a male. Accordingly, υ satisfies$_{\mathcal{M}}$ $\ulcorner\neg\varphi(\mathbf{x})\urcorner$ with respect a possible world w if, and only if, $\upsilon(\mathbf{x}) \in Q(w)$ and υ fails to satisfy$_{\mathcal{M}}$ $\ulcorner\varphi(\mathbf{x})\urcorner$ with respect to w. υ satisfies$_{\mathcal{M}}$ $\ulcorner\Box\varphi(\mathbf{x})\urcorner$ with respect a possible world w if, and only if, $\upsilon(\mathbf{x}) \in Q(w)$ and for any possible world w', υ satisfies$_{\mathcal{M}}$ $\ulcorner\varphi(\mathbf{x})\urcorner$ with respect to w' (cf. [4, p. 340]).

3. Haecceitism and Simplest Quantified Modal Logic

A subset of Kripke models constituting an autonomous semantics consists of those models whose function Q is such that for any world $w \in W$, $Q(w) = D$. A logical system that is complete with respect to this class of models — called constant domains semantics — is the simplest quantified modal logic (*SQML*).

The language $\mathcal{L}_2$ of *SQML* is obtained by adding to $\mathcal{L}_1$ a set of individual constants. Its axiomatic basis is formed in a very straightforward way by the axioms and rules of the normal modal propositional system K, the axioms and rules of classical first-order logic, and Barcan schemes. Although haecceitism has been thought to require a Kripke-style semantics, a preferable alternative is to combine it with *SQML* supplemented by a primitive predicate expressing co-exemplification of essences and a postulate formalizing the nature of essences. Not only does this approach have all the advantages of *SQML* — among them, the possibility of formalizing sentences containing names, such as (3), as well as a greater simplicity in combining classical quantification and modal operators — but it also better conforms to the actualist program.

Unlike possibilists, actualists find quantification over possibilia to be nonsense. According to Pollock, "the claim of the actualism is that there is no reasonable way to understand $\ulcorner\exists\mathbf{x}\urcorner$ which allows it to range over merely possible objects" [11, p. 130]. That is, actualists interpret the particular quantifier as existentially loaded. The sense of such a definition, though, depends on how the notion of existence is defined in its turn. Because actualists aim to reduce all existential questions to quantificational ones, actualism should be understood as the conjunction of these two theses: (a) there are no things that do not exist; and (b) any universal sentence in the object language is about all existing things. What (a) and (b) say can be said in a Quinean way: (*necessarily*) to be means to be the value of a bound variable (cf. [14]). So defined, actualism cannot be accommodated in the haecceitistic Kripke-style models.

Consider an haecceitistic Kripke model $\mathcal{M} = \langle W, @, D, VQ\rangle$ such that the actual domain $Q(@)$ does not contain the essence G. That is, G is not exemplified in @, although it is exemplified in some possible world, according to our definition of individual essence (cf. Section 2). From the point of view of the metalanguage, G is an abstract object that actually exists. Nevertheless, all true$_{\mathcal{M}}$ universal sentences are not about G, i.e., they are not true$_{\mathcal{M}}$ of G. The existence of G in @ cannot be expressed by quantification in the object language, so that from the point of view of the object language G actually exists in a sense that will be obscure to actualists. In other words, G is not a value of a bound variable. Suppose now that G is in $Q(@)$ but not in the domain of some possible world w. In this case, we are committed to the truth of the following proposition: there could have existed objects that would not have been values of bound variables. Thus the Quinean sense of actualism fails for the object language of the models. These unpleasant consequences can be avoided by adopting models with an unique domain of discourse, the actual one, in which quantifiers are required to range over *all* essences, and in which *all* essences exist and are actual. The property of being actual can be formalized in the object language by using the actuality operator (cf. Section 3.1).

Before we see how, we need to capture the haecceitistic sense of identity that Plantinga himself seems to have overlooked. Consider that in first-order logic formulas of the form $\ulcorner \mathbf{t}_1 = \mathbf{t}_2 \urcorner$ are satisfied in an appropriate model under some assignment υ if, and only if, $\mathbf{t}_1$ and $\mathbf{t}_2$ designate the same object in the domain of the model. But this cannot be the sense identity has in a context in which predication is understood in terms of co-exemplification. Since identity is a predicate applying to terms denoting essences, formulas of that form will be satisfied in a model (under υ) in a world w if, and only if, identity is co-exemplified in w with the essences denoted by $\mathbf{t}_1$ and $\mathbf{t}_2$. That is, if w had been actual, there would have been an object exemplifying both the essences expressed by

$\mathbf{t}_1$ and $\mathbf{t}_2$. Therefore haecceitistic identity means co-exemplification of essences. Accordingly, we provide $\mathcal{L}_2$ with a primitive predicate, "$\approx$", expressing co-exemplification of essences, together with the following postulate **P** on essences: for any essences G_1 and G_2, if G_1 and G_2 are co-exemplified, then necessarily G_1 and G_2 are qualitatively indiscernible.

Let $\mathcal{M} = \langle W, @, D, V\rangle$ be the intended haecceitistic constant domain model we are looking for. W and $@$ are defined as usual. D is the unique domain of discourse containing all individual essences. V is a function such that for any n-place predicate ψ, for any $w \in W$, $V(\psi^n, w) \subseteq D^n$; for any individual constant $\mathbf{a}$, $V(\mathbf{a}) \in D$. V conforms to **P** in assigning extensions to "$\approx$", so that the scheme $\ulcorner \mathbf{t}_1 \approx \mathbf{t}_2 \rightarrow \Box(\varphi(\mathbf{t}_1) \leftrightarrow \varphi(\mathbf{t}_2))\urcorner$ will be true$_{\mathcal{M}}$ for any $\mathcal{M}$ under **P**. Now, let υ be the usual assignment from variables into essences. Then, υ satisfies$_{\mathcal{M}}$ $\ulcorner \mathbf{t}_1 \approx \mathbf{t}_2\urcorner$ with respect to a world w if, and only if, $\langle d_{\mathcal{M},\upsilon}(\mathbf{t}_1), d_{\mathcal{M},\upsilon}(\mathbf{t}_2)\rangle \in V(\approx, w)$, where $d_{\mathcal{M},\upsilon}(\mathbf{t}_i)$ is the denotatum of $\mathbf{t}_i$ in $\mathcal{M}$ under υ. υ satisfies$_{\mathcal{M}}$ the atomic formula $\ulcorner \psi^n \mathbf{t}_1 \ldots \mathbf{t}_n\urcorner$ with respect to a world w if, and only if, for each $\mathbf{t}_i$, $\langle d_{\mathcal{M},\upsilon}(\mathbf{t}_i), d_{\mathcal{M},\upsilon}(\mathbf{t}_i)\rangle \in V(\approx, w)$ and $\langle d_{\mathcal{M},\upsilon}(\mathbf{t}_1, \ldots, d_{\mathcal{M},\upsilon}(\mathbf{t}_n\rangle \in V(\psi^n, w)$. υ satisfies$_{\mathcal{M}}$ $\ulcorner\neg\varphi\urcorner$ with respect to a world w if, and only if, υ fails to satisfy$_{\mathcal{M}}$ φ with respect to w. υ satisfies$_{\mathcal{M}}$ $\ulcorner\varphi \vee \psi\urcorner$ with respect to a world w if, and only if, υ satisfies$_{\mathcal{M}}$ φ with respect to w or υ satisfies$_{\mathcal{M}}$ ψ with respect to w. υ satisfies$_{\mathcal{M}}$ $\ulcorner\forall \mathbf{x}\varphi\urcorner$ with respect to a world w if, and only if, for any υ' different from υ at most for $\mathbf{x}$, υ' satisfies$_{\mathcal{M}}$ φ with respect to w. υ satisfies$_{\mathcal{M}}$ $\ulcorner\Box\varphi\urcorner$ with respect to a world w if, and only if, υ satisfies$_{\mathcal{M}}$ φ with respect to any possible world w'.

Satisfaction conditions for negation and modalities formalize their *de dicto* senses. The *de re* senses can be expressed in a secondary way, so that the *de re* sense of (3) is captured by "$\exists x(x \approx s \wedge \neg Wx)$", i.e., there is an individual essence co-exemplified with the essence of being Socrates and that essence is not co-exemplified with the property of being wise; and (4) becomes "$\exists x(x \approx s \wedge \Box(\exists y(y \approx x) \rightarrow My)$", i.e., there is an essence co-exemplified with the property of being Socrates and that essence is co-exemplified with the property of being a male in any world in which it is exemplified. As noted by Linsky & Zalta, a problem arises with the use of the *de dicto* sense of negation, for it seems to force us to reject the classical principle of conversion, $\ulcorner\Box([\lambda \mathbf{y}\neg P\mathbf{y}]\mathbf{x} \leftrightarrow \neg P\mathbf{y})\urcorner$ [12, p. 442]. Indeed, the scheme $\ulcorner(\neg P\mathbf{x} \wedge \neg[\lambda \mathbf{y}\neg P\mathbf{y}]\mathbf{x})\urcorner$ turns out to be satisfiable in those worlds in which $\mathbf{x}$ is not exemplified. However, it is plausible to think that the classical principle of conversion fails if applied to entities that are not self-identical. Hence, it should be taken in the form $\ulcorner \mathbf{x} \approx \mathbf{x} \leftrightarrow \Box([\lambda \mathbf{y} \neg P\mathbf{y}]\mathbf{x} \leftrightarrow \neg P\mathbf{y})\urcorner$. So conceived, it holds with respect to our haecceitistic constant domains models (under **P**).

The main reason for which **BS** is thought to be committed to possibilia is that combining it with the theses of actualism, certain intuitively true sentences, such as (1), cannot be formalized without contradiction. By **BS**, it follows from (1) that there exists something that does not exist, just as it follows from (2) that there is an exemplified essence such that it is not exemplified. In $\mathcal{L}_2$ (1) will be formalized by (5) "$\Diamond\exists x(\exists y(y \approx x) \wedge \mathcal{A}\forall z(z \not\approx x))$", where "$\mathcal{A}$" is the actuality operator, for which cf. [3]. According to our intended constant domains semantics, (5) is to be interpreted as: possibly, there exists an exemplified essence such that there exists no essence actually co-exemplified with it. From (5) by **BS** it follows "$\exists x\Diamond(\exists y(y \approx x) \wedge \mathcal{A}\forall z(z \not\approx x))$". This last sentence, though, is perfectly accectable for an actualist, since it only says that there exists a possibly exemplified essence that is not actually exemplified.

The problem with the **CBS** is that of contingency. Consider the sentence (6) "there exists something that could have not existed". Interpreting quantifiers as existentially loaded, by **CBS** it follows from (6) that possibly there exists something that does not exist. If (6) is interpreted in the same way Plantinga suggests for interpreting (1), we obtain (7) "there is an exemplified essence such that possibly it is not exemplified". By **CBS** it follows from (7) that possibly there is an exemplified essence such that it is not exemplified. This contradiction does not arise in our haecceitistic constant domains semantics, in which (6) is interpreted as (8) "$\exists x(\exists y(y \approx x) \wedge \Diamond\forall z(z \not\approx x))$". From (8) by **CBS** the unproblematic sentence "$\Diamond\exists x\neg\exists y(y \approx x)$" follows, that means: possibly there exists an essence that is not exemplified. Following Williamson [15], two senses of existing are here employed, the substantival and the logical: the essence x exists in a substantival sense if, and only if, $\exists y(y \approx x)$; the essence x exists in a logical sense if, and only if, $\exists y\Diamond(y \approx x)$.

Finally, serious actualism is formalized by the scheme $\ulcorner\Box(\varphi(\mathbf{x}) \rightarrow \exists \mathbf{y} \approx \mathbf{x})\urcorner$ (**SA**), which holds in every haecceitistic constant domains models under the postulate **P**.

3.1. Further considerations

Bennett [2] argued that there are deep similarities between Plantinga's modal semantics and the ontological theory called Contingent Nonconcretism (CN), which has been regimented in $SQML$ by Linsky and Zalta

[12, 13]. According to Bennett, both views are proxy actualist, but not genuinely actualist. As pointed out by Nelson and Zalta [7], the definition of proxy actualism, for which cf. [2, p. 272], cannot be straightforwardly applied to Plantinga's semantics [7, p. 283]. Aside the question of whether Plantinga's semantics is a form of proxy actualism, Bennett's main point is that CN and Plantinga's haecceitism are not actualist because existence and actuality fail to be extensionally equivalent in both theories. Suppose to define actuality informally as follows: x is actual if, and only if, x is in the actual domain of discourse. If so, haecceitistic Kripke-style semantics, as defined above following Jager [4], is not actualist, for it allows existent objects not being in the actual domain of discourse $Q(@)$, i.e., the essences that are not actually exemplified. Those essences exist, for they are values for the interpretation function υ, but they are not actual insofar they are not in $Q(@)$. Instead, in the haecceitistic semantics we have proposed in Section 3 a unique domain of discourse is employed, i.e., the actual one. Therefore all essences exist and are actual, from the object language as well as the metalanguage point of view. Actuality is formalized in the object language by stating that the property of being actual is the property of being actually possibly exemplified: x is actual if, and only if, $\mathcal{A}\exists y\Diamond(y \approx x)$. Accordingly, the biconditional: everything logically exists if, and only if, it is actual will be formalized as follows: $\forall x(\mathcal{A}\exists y\Diamond y \approx x \leftrightarrow \exists y\Diamond(y \approx x))$.

Acknowledgments. I would like to thank two anonymous reviewers as well as Editors of this Journal for their comments on earlier versions of the paper. This research was supported by the scholarship "Francesca Jacona della Motta – Città di Caltagirone".

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